

Horticulture for the Visually Impaired

by

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# Horticulture for the Visually Impaired

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Sharon Fox and Carey Burriss, Jr.<sup>1</sup>

Horticulture has been enjoyed by sighted persons for many years. It offers many new and challenging experiences in learning and creativity. There is also satisfaction in growing old favorites and utilizing them in familiar ways: creating simple flower arrangements from home-grown zinnias or eating fresh corn-on-the-cob from the home garden is certain to bring pleasure.

In the past, the tendency has been to limit the blind person's horticultural experiences to plant materials with fragrant leaves, blossoms and/or unusual textures. However, the visually impaired, can enjoy growing any of the plants which a sighted person grows. Through touch, the blind are often able to "see" more than people with unimpaired vision.

The aim of this paper is to present horticultural techniques in a manner that will enable the visually impaired to understand and utilize these techniques, and to enjoy a wide variety of plant materials.

Copies of this publication will be translated into braille for a small fee.

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## Sowing Seeds in Flats

Many vegetable seeds, such as tomatoes, peppers, petunias, and impatiens should be sown in flats and later transplanted to the garden. There are two good ways to sow seed: in pressed peat pellets or in a peat-lite mix, both can be purchased from a garden supply store.

### Pressed Peat Pellets

Pressed peat pellets are about the size of a quarter when dry, and when they are placed in water they expand to approximately the size of an egg.

Place as many pellets as you will use in a bucket of water until they expand. This takes about fifteen minutes. Handle them as little as possible while they are in the water since they will come apart quite easily at this stage.

After they have expanded, place the pellets in a shallow container for easier handling. Put two or more small seeds (such as tomato) or one large seed (such as cucumber or squash) into each pellet. The smaller seeds should be planted very shallow. The larger seed can be pushed down halfway into the expanded pellet.

Cover the seed lightly with a peat-lite mix and put three or four layers of newspaper over the pellets. Moisten the newspaper and keep it moist until the seeds germinate. When germination begins, remove the newspaper and keep the pellets moist.

When the plants are three or four inches high, they may be planted into the garden. Place the pellet with the plant growing in it into the soil. Be sure to cover the pellet completely with soil.



### Peat-lite Mix

Moisten the mix slightly and place it in a shallow container at least three inches deep. Milk cartons turned on their side with the top side removed can be used for seed trays. Smooth the mix with your hand.

Sprinkle the seeds as evenly as possible over the mix. Small seeds such as petunias and snapdragons should not be covered with mix, but larger seeds such as tomatoes and marigolds should be covered with one-fourth inch of mix.

Place several layers of newspaper over the seeds, letting the paper extend up the sides of the tray. Pour water on top of the paper and keep it moist until germination begins. Check after three days to determine if germination has begun. You can lightly touch the top of the soil with your fingertips and you will be able to tell when the seeds are beginning to sprout. You can feel small "bumps" on the soil. Then remove the paper. After the paper has been removed, water carefully so as not to wash up the seedlings. A sprinkler bottle is ideal for this.

## Mixing Soil

Start with a good garden loam which has been screened to remove roots, grass, and rocks. A soil screen is a large mesh hardware cloth framed with boards. Typically, the screen measures twenty-four by twenty-four inches. Shake the screen back and forth as you pour soil on top, or push the soil around over the screen with your hand. The soil will fall through the mesh leaving roots, grass, and rocks on top.

After screening, the soil should be sterilized. It can be sterilized by heating in shallow pans in a 200° oven for two hours.

A three gallon container is an ideal size for measuring the ingredients of a soil mixture. Fill the container with each ingredient and pour into a wheelbarrow or large tub. You can mix the soil with your hands, or a trowel. Stir and turn it several times to make sure it is thoroughly mixed.

### Tropical Mixture

This soil mixture is used for most plants except cacti and succulents. It is suitable for potting up vegetable and foliage plants. A tropical mixture consists of: 1 part garden loam, 1 part peat moss or well-rotted sawdust, and 1 part perlite or sand.

### Succulent Mixture

This mixture is used for desert plants such as cacti and succulents. This mixture consists of 1 part garden loam, 1 part peat moss or well-rotted sawdust, and 2 parts sand.

### Transplanting

When the plants in the flats get large enough to handle, they should be transplanted to peat pots. You may mix your own soil or buy a ready-mixed soil for this. Fill the peat pots with soil before you begin to work.

In a flat, there may be as many as a thousand seedlings to prick off. The seedlings must be handled with care so you will not knock off the tops or injure the roots. To prick off the seedlings, first reach into the soil beneath the plants with your fingers and grasp a small bundle of them. Hold the roots and soil firmly and place them on a moist newspaper. Carefully remove the soil from around the roots. Never squeeze or bruise the stems. Take one seedling and plant it in a peat pot filled with soil. Use your finger to make a hole in the soil for the plant. Carefully push the soil around the roots and stem of the plant. After transplanting, water the plant carefully,

When the plants are large enough to go into the ground, plant the peat pot with the plant growing in it. Be sure to cover the peat pot completely.

## Vegetable Gardening for the Visually Impaired

A visually impaired person will need very little assistance in planting and caring for a vegetable garden. Help will be needed, however, with some tasks such as the initial tilling of the soil, setting posts for plant supports, and controlling insect pests.

Keep the garden small so that a visually impaired person can tend it easily. An 18' x 24' plot gives sufficient space for a vegetable garden; dimensions may be altered to meet individual needs.

A vegetable garden should be planted where it will receive at least six hours of sunlight a day. Select a site which is well drained, since good drainage is essential to plant growth. Most soil types can be productive if properly managed. Sandy soils will benefit from the addition of organic materials such as peat moss, rotted leaves, or well-rotted sawdust. Clay soils may need to be amended by adding sand and organic materials.

The garden that is to be tended by the visually impaired should have a clearly defined border. Boards, bricks, cement blocks, or cross ties can be used to mark the perimeter of the garden.

### Preparing the Soil

Spade or till the soil to a depth of six to eight inches. Work parallel to the eighteen foot side of the garden; this means you will start at one twenty-four foot side and work across the opposite twenty-four foot side.



After the garden is tilled, it can be marked off with stakes and string into areas six feet wide. Each six-foot area is made ready for planting before moving the stakes to the next six-foot area. This eliminates moving the stakes unnecessarily.

A yardstick makes an ideal marker to use in the garden. The yardstick is marked with one notch at one foot and two notches at two feet. It becomes a tool for all of the measurements a blind person needs to make in the garden.

To mark off the first area, drive stakes into the opposite corner on the 18' side of the garden. Tie a strong string to one stake, stretch it across the garden, and tie it to the other stake. (These stakes will be referred to as stakes A.) Measure from stakes A down the twenty-four foot side of the garden the length of two yardsticks (6 feet) and drive down a stake. Go to the opposite side of the garden and repeat. Join these two stakes with strong cord. (These stakes will be referred to as stakes B). These two cords across the garden will serve as guides as you work.

Weeds and grass will need to be removed and the garden area raked. Use a garden rake at this stage of preparation as a leaf rake will not be strong enough. Knee pads are a great help when picking up weeds and grass and also weeding the garden. They may be purchased from a garden center or sporting goods store.

Working between the stretched cords, start at the far end of the area and rake toward yourself. This will bring the weeds and grass within easy reach so that you can pick them up and deposit them in a basket or bucket. Rake

and remove grass and weeds until you reach the opposite side of the 6' area.

If the soil needs organic material, it should be added at this point. Starting at one end of the 6' area, spread organic material over the soil to a depth of three to four inches.

Fertilizer can be broadcast on top of the organic material. For an 18' x 24' area, apply 12lbs. of 5-10-10 fertilizer. Ask someone to measure 3 lbs. of fertilizer into each of four separate containers. This will enable you to broadcast the correct amount over each 6' area between the cords.

Starting in the near left corner of the area, spread one small handful of fertilizer to your right with a slight toss of your hand. Stay near the cord on your left side and broadcast a handful of fertilizer with each step. When you reach the opposite side of the garden turn around so that the other cord is on your left, and broadcast the fertilizer in the same way across the 6' area again. Repeat this process until you have spread three pounds of fertilizer over the area.

The fertilizer and organic matter need to be spaded into the soil. Starting in one corner, spade across the area from one side to the other side. Move over one step and spade back across to the other side. Continue spading in this manner until all of the 6' area has been spaded.

The area can now be raked smooth and stakes A moved to form a new six-foot wide area. Keeping the yardstick close to the edge of the 24' side, measure six feet down from stakes B. Move stakes A to that point to form the new work area.

## Planting the Garden

Suggested vegetables are:

Tomato  
Cucumber  
Corn  
Okra  
Squash  
Pepper  
Green beans

The first row will be placed three feet from one 18' end of the garden. Allow three feet between rows. It will be necessary to have posts at the ends and in the middle of the first row to support cucumbers and tomatoes. If wooden posts are used, they should be treated with a wood preservative and should be about five feet high after they are set in the ground. Fasten heavy wire to an end post one foot above the ground, and stretch it across the row, fastening it to the center and opposite end post. Attach another wire near the top of the posts. A third wire should be attached in the same manner midway between the first two wires.

Five foot high bamboo stakes serve as additional supports. Measure two feet along the bottom wire from the outer edge of the end post and hold the first cane upright against the wires. Wrap a plastic bag tie around the bottom wire and the cane. To fasten the cane to the top wire, measure two feet from the post along the top wire and fasten the cane to the wire with a tie. Attach the cane to the middle wire. Repeat this process until you have placed canes two feet apart across the row.

Divide the planting of cucumbers and tomatoes to suit your needs-- normally more tomatoes are needed than cucumbers. The tomatoes and cucumbers will be planted two feet apart. Plant four cucumber seeds at a bamboo stake.

Push each seed into the soil to the depth of the first joint of your finger and cover the seed with soil. Plant the seeds about two inches apart. When the seeds germinate, thin to two plants per stake.

Tomato seed should be started in containers and then transplanted to peat pots. When the plants are approximately six inches tall, they can be set out in the garden. Remove the top rim of the peat pot before planting the tomatoes in the soil. Any part of the peat pot left above the soil will act as a wick and draw moisture from the soil. Near the cane support, dig a hole with a trowel deep enough to completely cover the peat pot when it is planted. Set the plant (still growing in the peat pot) into the hole and pour approximately one cup of water around it. Rake the soil around the plant with your hand. Do not mound the soil around the plant because that would cause rain water to run off before it is absorbed into the ground around the plant. If the plants begin to wilt after a day or two, pour more water around them.

Corn will be planted in the next three rows. Measure three feet from the tomato/cucumber row down the twenty-four foot side of the garden. Drive a stake. Repeat on the opposite side of the garden. Stretch a strong string across the garden between the stakes. Using the string as a guide, plant the corn one foot apart across the row. Dig a hole the depth of your index finger and drop four or five seeds into it. Fill the hole with soil. When one row has been planted, move the stakes and string and plant two more rows of corn, each row three feet apart. After the corn comes up, thin to two stalks per planting.

Mark off the next row with stakes and string in the same way, to plant okra. Okra should be planted at one foot intervals. Dig a hole about two inches deep (this is about as deep as two joints of your finger) and place six seeds in each hole. Cover the seeds with soil. When the seeds germinate, thin to two plants. Okra seed may take as long as ten days to germinate.

Move the stakes and string three feet farther down the garden to mark a row for squash and peppers. These may be planted two feet apart. Divide the plantings of squash and peppers to suit your needs. Pepper seed will need to be sown in containers, transplanted to peat pots, then planted in the same way as tomatoes. Squash should be planted about an inch deep at one foot intervals. Plant six seeds in each space; later thin to three plants.

Move the stakes and string down three feet and plant a row of bush beans. Plant about three inches deep, at one foot intervals. Put six seeds in each space; thin the seedlings to three per planting.

#### Care of the Garden

Once planted, the garden will need to be watered, weeded, and harvested. Insects must also be controlled.

From May to September, if no rain falls for a week, the garden will need to be irrigated. A lawn sprinkler serves nicely for this. Move the sprinkler around the garden to be sure all areas are watered for at least one hour.



Spend some time getting to know your vegetable plants. They will soon become familiar, and you will be able to recognize and pull weeds from around them.

If insects appear, Sevin and Malathion will usually take care of the problem. Follow package directions. Ask a sighted friend for some assistance with this.

The size of the cucumbers, okra, squash, pepper, and snap beans will indicate when they are ready to harvest. Corn is ready when the silk, which resembles hair at the end of each ear, begins to dry. Pull back a small part of the shuck and push your fingernail into one of the kernels. It should pop as if it were full of liquid. Ask a sighted friend to tell you when the tomatoes have ripened.

The vegetables grown in the summer can be replaced by cool-weather crops in the fall and spring.

## Propagation of House Plants by Stem Cuttings

House plants easily propagated by stem cuttings:

<u>Aglaonema</u> . . . . .	Chinese evergreen
<u>Cissus rhomdifolia</u> . . . . .	Grape ivy
<u>Crassula argentea</u> . . . . .	Jade plant
<u>Ficus elastica</u> . . . . .	Rubber plant
<u>Peperomia obtusifolia</u> . . . . .	Pepper face
<u>Philodendron cordatum</u> . . . . .	Philodendron
<u>Pilea berterfonia</u> . . . . .	Moon Valley plant
<u>Pilea cadieri</u> . . . . .	Aluminum plant
<u>Podocarpus macrophylla</u> . . . . .	Podocarpus
<u>Tradescantia</u> . . . . .	Wandering Jew

Almost any clean container with drainage holes may be used to hold the rooting medium. The medium can be perlite, vermiculite, or sand. After the container is filled, the medium should be thoroughly moistened.

Use a sharp, clean knife or snips to make the cuttings. To make a stem cuttings, cut below a node. A node is a knot where the leaves join the stem.

Each cutting should be approximately three inches long, and not more than six inches long. Remove the lower leaves and stick the cuttings into the medium to a depth of about two inches.

When all the cuttings have been put into the rooting medium, water them thoroughly. The medium should never be allowed to become dry. A plastic bread wrapper or a laundry bag may be placed loosely over the cuttings while the roots form.

After about two weeks, tug gently on the cutting to see if it has rooted. A rooted cutting will not pull easily from the container.

Shrubby easily propagated by stem cuttings: azalea, camellia, boxwood, holly.

The same procedure used for house plants is also used for shrubby cuttings. The tips of shrubby limbs are taken for cuttings. Usually the cuttings are best taken in mid to late summer.

These cuttings usually take about six weeks to root.

### Drying Flowers in Sand

Flowers that dry well in sand: anemones, daffodils, dwarf marigolds, grape hyacinths, lilac, rose buds, small dahlias, and zinnias.

You will need a cardboard box approximately five inches deep and the box should have a lid.

You will also need white washed sand which may be purchased from a builders supply or concrete company. Ordinary sand can not be used because it is dirty and will discolor the flowers.

Cut the flowers after the dew has dried and no moisture is present on the petals. Do not cut too many flowers at one time since wilting may occur before the flowers can be placed in the sand.

Place a layer of newspaper over the bottom of the box and then pour in about one inch of sand.

You will need some wire about the size of a heavy pin to insert into some of the flowers which have weak stems. This wire may be purchased from a florist shop or hardware store. Cut the wires into lengths approximately six inches long.

Cut the stem where it ends at the calyx. The calyx is the large bump between the flower petals and the stem. Hold the flower in your hand with the index finger over the center front of the flower. Insert the wire where the stem was cut through the calyx until you feel the wire come through the flower.

Lay the flowers, with inserted wire, flat on the sand. Holding the flower, gently sift the sand over it until it is completely covered. Sift only a small amount of sand over the flower at a time. Too much sand at one time will crush the flower and cause it to lose its shape.

You will need small plant labels or drinking straws for markers. Insert a marker after each flower. Be careful not to let the flowers touch.

Moving toward the front of the box, lay the next flower in the same way until you come to the side of the box. Put the flowers down in rows until the box is filled.

Mark the box with something to determine the front and cover it with the lid. Leave it covered for six days or more.

To remove the flowers from the sand, turn the front of the box toward you and gently locate the wire on the right side of the box. Remove the flowers by lifting the wire slowly toward the flower and gently pulling it from the sand.

Holding the wire in your right hand gently tap the flowers on your left hand to remove any sand that clings to the petals.

Stick the wires into a pot of soil, spray the flowers lightly with clear acrylic spray. When the spray is dry, store the flowers in a covered container until ready for use.



## Helichrysum - Strawflowers

Strawflowers are about the size of large marbles when harvested. The colors vary through the yellows, oranges, golds, and pinks. Almost every color can be found except a true red and a true blue. The center of the flower feels like a fine nylon brush.

When the flowers open they are completely dry. The flowers are harvested in the bud stage because as they dry they continue to open. If harvested too late, they will shatter when completely open.

It is necessary to put strawflowers on a wire to dry because the stem cannot support the flower when dry. To dry strawflowers, a piece of wire about the size of a pin is inserted into the stem side of the flower. If some of the stem remains on the flower, remove it before inserting the wire. These wires can be six to ten inches long.

Strawflowers should be put on the wire the day they are harvested. They can be refrigerated two or three days if the job is not completed. Insert the wire into the stem end so that it goes through the flower but does not come through the front. Placing your finger over the front of the flower will help you to feel the wire as it comes through.

Stick the wired flowers upright into a pot of sand to dry. Many flowers can be placed into one pot. Depending on weather conditions, flowers will dry from three days to one week.

To store, pack the flowers in boxes. Lay one layer right to left and the next layer left to right.

## Potpourri

### Materials:

1. One gallon dried flower petals
2. One box plain salt
3. One tablespoon allspice
4. One ounce oil of Bergamot
5. One-half ounce orris root powder
6. Small box of ground cinnamon
7. One box bay leaves

In making potpourri most any type of flowers can be used. Remove the flower petals and spread thinly on a newspaper in a box. Stir the petals about once a day until they are dry. This will take about a week. When you have dried enough petals you are ready to mix the ingredients together. Have all ingredients measured and ready to use.

You will need about a two gallon container for mixing. Pour all ingredients into the container with dried petals and mix thoroughly.

Pack the potpourri in a wide mouth gallon jar and cover tightly for six weeks.

Take the potpourri out and put into small jars or small cloth bags. Open the jars a few hours to scent the room. The sachet bags can be hung in closets.

## Terrarium Construction in Large-Mouthed Containers

### Materials:

1. Clear glass containers with large openings
2. Gravel
3. Tropical soil mix
4. Charcoal
5. Small figurines (optional)
6. Colored gravel or sand (optional)
7. Tropical plants

### Preparing the Container

Make sure the container is clean. A large-mouthed container is suggested because of the ease of planting. A container with a small opening would be difficult for an individual with impaired vision to work with.

Select small, pea-size gravel if possible; place the gravel in the bottom of the container to a depth of about one inch (about  $1\frac{1}{2}$  joints on your finger). If large gravel is used, cover the bottom of the container with one layer of gravel.

Ordinary charcoal briquettes may be used in a terrarium to absorb impurities in the soil. Use one charcoal briquette for each gallon container. Place the charcoal between newspapers or in a paper bag and crush it into small pieces with a hammer. Sprinkle the charcoal over the layer of gravel.

Place the soil into the container. After the soil is leveled, it should be about one-fourth the height of the container. To measure this amount, a wire or piece of cardboard may be used. Place the wire in or beside the container, and cut it off even with the top of the container. This will be the container height. Next, cut the wire in half. Take one of the pieces and cut it in half as before. You will now have a piece of wire which is one-

fourth the height of the container. This wire can be held upright, touching the bottom of the container, while the soil is being poured into the container. Pour the soil and level it until it covers the wire, then remove the wire.

You may landscape your terrarium by mounding the soil. Using the mound as the back of the container, let the soil slope down toward the front.

### Planting

If the plants are in peat pots, remove the peat pots and as much of the soil as possible. You may trim the largest roots, if necessary, to fit the plant in the container.

Gently place the plants in the soil and cover the roots well. Press the soil lightly around the roots.

The tallest plants may be placed toward the back, and the smaller plants toward the front. You may use vines such as creeping fig around the edges. Also, a tall plant may be placed in the center of a round container with smaller plants around it. The plants should be placed in so that each plant may be seen--leave some space around each plant. Do not crowd too many plants into one container.

### Watering

Water your terrarium carefully until all the soil feels moist, but not soggy. A small styrofoam or paper cup with pin holes in the bottom may be used to water the terrarium. Pour water into the cup and let it sprinkle gently into the soil.

### Decorations

White sand, colored gravel or small plastic or ceramic animals may be placed at the front of the terrarium for interest.

To clean the inside of the container, use a damp paper towel and carefully wipe the walls of the container.

### Future Care

The terrarium should be placed in bright indirect light. Near a sunny window is good. Never place it directly in a window where it will get direct sunlight.

Plants in a terrarium will not need to be watered as often as other house plants because water droplets form on the sides of the container and fall back into the soil. Check the soil about every two to four weeks to make sure it is damp to the touch.

As the plants grow, many may get too large for the container. The height of some plants may be controlled by pinching off the top growth. Other plants may have to be replaced as they outgrow the container.



SHARON FOX has been a vital asset to the Department of Horticulture of Clemson University for the past seven years. Her early work with the department was in floriculture and ornamental horticulture. Since 1972 she has been an instrumental part of the Hortitherapy Program. She has given students, both undergraduate and graduate, and volunteers training in horticultural arts and skills and supervision for conducting Hortitherapy Programs. Using her creative talents, she has developed and published many lesson plans and craft ideas for use in such programs. Her publications include Special Education Classes; The Consturction and Care of Terrariums; Indoor Horticultural Activities for Nursing Homes; Drying, Preserving, and Utilizing Plant Materials; and Bonsai for Everyone.

CAREY BURRISS, JR., is an important member of the staff in charge of greenhouse and garden maintenance employed by the Department of Horticulture under the supervision of Sharon Fox. Becoming totally unsighted after a gunshot wound at the age of 18, he participated in a vocational horticulture training program at the S. C. Commission for the Blind in Columbia under the direction of Dr. Dennis Abdalla. Devising his own horticultural techniques through this training and his work with Sharon Fox, he is able to work with the whole realm of plants and very capably fills his present position with the department.



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